

***Impact Attenuation***

**Marine Corps Helmets**

**MICH (TC-2000)  
Lightweight Helmet (LWH)  
PASGT**

**Marine Corps Team  
Natick Soldier Center  
Natick, MA 01760**

**01 AUG 2003**

## **Introduction**

The purpose of this report is to document the results of impact protection testing of the Modular Integrated Communications Helmet (MICH) in comparison to the USMC Lightweight Helmet (LWH) and the currently issued Personal Armor System-Ground Troops (PASGT) Helmet.

## **System Description**

The MICH is a special-purpose helmet intended to provide operators with some level of ballistic and impact protection while affording the opportunity to incorporate an enhanced situational awareness and integrated communications packages. This helmet utilizes a pad-suspension system and a four-point retention system.

The LWH is intended as a one-for-one replacement of the current Personnel Armor System, Ground Troop (PASGT) helmet worn by Marines in a wide spectrum of combat scenarios. It provides ballistic and non-ballistic impact protection. The LWH has an improved leather/web suspension system with an integrated four-point retention system.

## **Test Methodology**

The test was conducted in accordance with ASTM F1446, "Standard Test Methods for Equipment and Procedures Used in Evaluating the Performance Characteristics of Protective Headgear". All impacts were from a drop height of 30 in. and dropped onto a flat anvil and conducted at ambient conditions. This height yields a theoretical impact velocity of about 13 ft/sec. For this test, the MICH helmet was tested in its standard 7-pad configuration, while the LWH and PASGT helmets used the three-piece Parachutists Impact Liner (PIL) and rear Impact Pad. The peak acceleration for each impact was recorded (see Figure 1).

## **Conclusions and Recommendations**

Both the MICH and the new USMC Lightweight Helmet (LWH) are considered as safe or safer to wear for all operations with respect to impact protection when compared to the current PASGT helmet. The helmet shells are both similar to that of the PASGT but provide better impact protection due to their suspension systems. The improved suspension and retention system of the LWH is considered an improvement over the current helmet in that they provides greater comfort and stability provided it is properly adjusted prior to use. The all foam pad suspension system of the MICH is superior for impact protection.

Average Headform Acceleration by Location

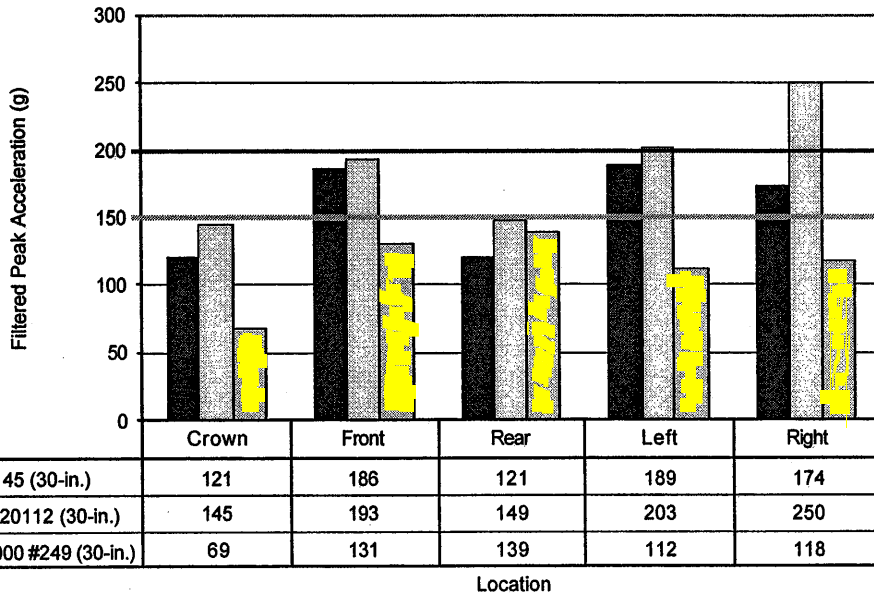


Figure 1. Results of Impact Attenuation Testing of USMC Helmets